



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/017,783	12/13/2001	Abdo Esmail Abdo	IBM / 156	6115
<div>7590 08/05/2008</div> <div>Thomas W. Humphrey Wood, Herron & Evans, L.L.P. 2700 Carew Tower 441 Vine Street Cincinnati, OH 45202-2917</div>				
			EXAMINER ALAM, SHAHID AL	
			ART UNIT 2162	PAPER NUMBER
			MAIL DATE 08/05/2008	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.



UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

MAILED

AUG 05 2008

Technology Center 2100

**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/017,783
Filing Date: December 13, 2001
Appellant(s): ABDO ET AL.

Thomas W. Humphrey
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed October 15, 2007 appealing from the Office action mailed November 1, 2005.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

Claims 1 – 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chadha et al. ('Chadha 495' hereinafter), US Patent 5,706,495 in view of Jones et al. ('Jones' hereinafter), US Patent 5,689,698 and further in view of Chadha et al. ('Chadha 146' hereinafter), US Patent 6,032,146.

NEW GROUND(S) OF REJECTION

Claims 8 – 10 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5,689,698	JONES et al.	11-1997
5,706,495	CHADHA et al.	1-1998
6,032,146	CHADHA et al.	2-2000

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

NEW GROUND(S) OF REJECTION

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 8 – 10 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

To be statutory, a claimed computer-related process must either: (A) result in a physical transformation outside the computer for which a practical application is either

disclosed in the specification or would have been known to a skilled artisan, or (B) be limited to a practical application with useful, concrete and tangible result.

A practical application can be either physical transformation or a useful, concrete and **tangible** result.

The claims lack the necessary physical articles or objects to constitute a machine or a manufacture within the meaning of 35 USC 101. They are clearly not a series of steps or acts to be a process nor are they a combination of chemical compounds to be a composition of matter. As such, they fail to fall within a statutory category. They are, at best, functional descriptive material *per se*.

The claimed subject is rejected under 35 USC 101 for being "software per se".

The claimed invention is addressed to "a program product for implementing a relational database system" that can be interpreted as referring to lines of programming within a computer system, rather than referring to the system as a physical object. The claimed invention is also addressed to "a relational database software" that is not a database system but is a software. Accordingly, the claim becomes nothing more than sets of software instructions which are "software per se".

"Software per se" is non-statutory under 35 USC 101 because it is merely a set instructions without any defined tangible output or tangible result being produced. The requirement for tangible result under 35 USC 101 is defined in *State Street Bank & Trust Co. v. Signature Financial Group Inc.*, 149 F.3d 1368, 47USPQ2d 1596 (Fed. Cir. 1998)

Claims 8 – 10 are not limited to tangible embodiments. In view of Applicant's disclosure, specification page 11, the medium is not limited to tangible embodiments, instead being defined as including both tangible embodiments (e.g., removable storage and hard disk drive) and intangible embodiments (e.g., a signal bearing media). These particular sections in the disclosure refer to "communication media" and/or "transmission media". Support of this media is also in claim 9.

Therefore, the claim is drawn to a form of energy. Energy is not one of the four categories of invention and therefore this claim(s) is/are not statutory. Energy is not a series of steps or acts and thus is not a process. Energy is not a physical article or object and as such is not a machine or manufacture. Energy is not a combination of substances and therefor not a composition of matter.

As such, the claim is not limited to statutory subject matter and is therefore non-statutory.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all Obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chadha et al. ('Chadha' hereinafter), US Patent 5,706,495 in view of Jones et al. ('Jones' hereinafter), US Patent 5,689,698 and further in view of Chadha et al. (Chadha ('46) hereinafter), US Patent 6,032,146.

With respect to claim 1,

Chadha discloses a method for revalidating previously generated statistics for a query directed to one or more attributes of a relation (see 7, lines 43-50, Fig. 3), comprising

identifying in said query a selection criterion on said one or more attributes of said relation (see col. 4, lines 45-46 et seq), and

revalidating a prior statistic generated for a prior different selection criterion on the same one or more attributes of said relation, based upon a measure of entropy of said one or more attributes of said relation (see col. 7, lines 11-20, Fig. 2 et seq).

Chadha does not explicitly indicate the claimed revalidating.

Jones discloses the claimed revalidating (request is revalidated, and a query plan will be formulate. If receiver client access is authorized, the MOL received at the receiver client is transformed into a second MOL, and transferred to the receiver client, see col. 15, lines 10-15, Fig. 40, Jones).

It would have been obvious to one ordinary skill in the data processing art at the time of the present invention to combine the teachings of the cited references, because the revalidating of Jones teaching would have allowed Chadha's system to optimize the query plan as suggested by Jones at col. 7, lines 52-57. Revalidating as taught by Jones improves to access the object in an object server in response to the database query, see col. 2, lines 33-35, Jones.

Chadha and Jones do not explicitly indicate the claimed entropy.

Chadha ('46) discloses the claimed entropy (rules used for data mining will appreciate that the association measures can be Chi-square, entropy, see col. 5, lines 14-15).

It would have been obvious to one ordinary skill in the data processing art at the time of the present invention to combine the teachings of the cited references, because the revalidating of Jones teachings and entropy of Chadha ('46) teachings would have allowed Chadha's system to optimize the query plan as suggested by Jones at col. 7, lines 52-57 and dimension reduction for data mining without the need for a domain expert as suggested by Chadha ('46) at col. 2, lines 67 to col. 3, lines 1).

As to claim 2,

Art Unit: 2100

Chadha teaches wherein said prior statistic is revalidated if a measure of entropy of said one or more attributes of said relation is less than a predetermined threshold ('input') value (see col. 7, lines 11-18 et seq).

As to claim 3,

Chadha teaches further comprising generating a measure for the entropy of said one or more attributes of said relation, by the steps of computing frequencies of different values for the one or more attributes in tuples of the relation (see col. 14, lines 2-15 et seq), and

combining the measured frequencies into a measure of the entropy of the attributes (see col. 13, lines 28-35).

As to claim 4,

Chadha teaches wherein generating a measure for the entropy of said one or more attributes of said relation further comprises collecting a sample of tuples of the relation, wherein frequencies of different values are computed for tuples in the sample (see col. 11, lines 37-45 et seq).

As to claim 5,

Chadha teaches wherein combining the measured frequencies comprises determining a number of distinct values for the one or more attributes, and converting the computed frequencies to probabilities by dividing the frequencies by number of distinct values (see col. 11, lines 37-45 and col. 9, lines 55-61 et seq).

As to claim 6,

Chadha teaches wherein combining the measured frequencies further comprises forming a weighted sum of the computed probabilities (see col. 11, lines 37-45 and col. 9, lines 55-61 et seq).

With respect to claim 7,

Chadha discloses a computer system implementing a relational database system and evaluating queries directed to said relational database (see 7, lines 43-50 and col. 9, lines 22-30, Fig. 3), comprising

storage for said relational database, including a relation having a plurality of tuples including values for a plurality of attributes (see col. 4, lines 45-46 et seq), and computing circuitry performing query optimization and query execution upon said relational database (see col. 3, lines 27-31), said query optimization including generating statistics for a query directed to one or more attributes of said relation, by identifying in said query a selection criterion on said one or more attributes of said relation (see 7, lines 43-50 and col. 9, lines 22-30, Fig. 3), by revalidating a prior statistic generated for a prior different selection criterion on the same one or more attributes of said relation, based upon a measure of entropy of said one or more attributes of said relation (see col. 7, lines 11-20, Fig. 2 et seq).

Chadha does not explicitly indicate the claimed revalidating.

Jones discloses the claimed revalidating (request is revalidated, and a query plan will be formulate. If receiver client access is authorized, the MOL received at the receiver client is transformed into a second MOL, and transferred to the receiver client, see col. 15, lines 10-15, Fig. 40, Jones).

It would have been obvious to one ordinary skill in the data processing art at the time of the present invention to combine the teachings of the cited references, because the revalidating of Jones teaching would have allowed Chadha's system to optimize the query plan as suggested by Jones at col. 7, lines 52-57. Revalidating as taught by Jones improves to access the object in an object server in response to the database query, see col. 2, lines 33-35, Jones.

Chadha and Jones do not explicitly indicate the claimed entropy.

Chadha ('46) discloses the claimed entropy (rules used for data mining will appreciate that the association measures can be Chi-square, entropy, see col. 5, lines 14-15).

It would have been obvious to one ordinary skill in the data processing art at the time of the present invention to combine the teachings of the cited references, because the revalidating of Jones teachings and entropy of Chadha ('46) teachings would have allowed Chadha's system to optimize the query plan as suggested by Jones at col. 7, lines 52-57 and dimension reduction for data mining without the need for a domain expert as suggested by Chadha ('46) at col. 2, lines 67 to col. 3, lines 1).

With respect to claim 8,

Chadha discloses a program product for implementing a relational database system and evaluating queries directed to said relational database (see 7, lines 43-50, Fig. 3), comprising

a relational database, including a relation having a plurality of tuples including values for a plurality of attributes (see col. 4, lines 45-46 et seq), and

relational database software performing query optimization and query execution upon said relational database (see col. 3, lines 27-31), said query optimization including generating statistics for a query directed to one or more attributes of said relation, by identifying in said query a selection criterion on said one or more attributes of said relation (see col. 5, lines 12-19), by revalidating a prior statistic generated for a prior different selection criterion on the same one or more attributes of said relation (see col. 7, lines 11-20, Fig. 2 et seq), based upon a measure of entropy of said one or more attributes of said relation, and a signal bearing media holding said relational database and relational database software (see 7, lines 43-50 and col. 9, lines 22-30, Fig. 3).

Chadha does not explicitly indicate the claimed revalidating.

Jones discloses the claimed revalidating (request is revalidated, and a query plan will be formulate. If receiver client access is authorized, the MOL received at the receiver client is transformed into a second MOL, and transferred to the receiver client, see col. 15, lines 10-15, Fig. 40, Jones).

It would have been obvious to one ordinary skill in the data processing art at the time of the present invention to combine the teachings of the cited references, because the revalidating of Jones teaching would have allowed Chadha's system to optimize the query plan as suggested by Jones at col. 7, lines 52-57. Revalidating as taught by Jones improves to access the object in an object server in response to the database query, see col. 2, lines 33-35, Jones.

Chadha and Jones do not explicitly indicate the claimed entropy.

Chadha ('46) discloses the claimed entropy (rules used for data mining will appreciate that the association measures can be Chi-square, entropy, see col. 5, lines 14-15).

It would have been obvious to one ordinary skill in the data processing art at the time of the present invention to combine the teachings of the cited references, because the revalidating of Jones teachings and entropy of Chadha ('46) teachings would have allowed Chadha's system to optimize the query plan as suggested by Jones at col. 7, lines 52-57 and dimension reduction for data mining without the need for a domain expert as suggested by Chadha ('46) at col. 2, lines 67 to col. 3, lines 1).

As to claim 9,

Chadha teaches wherein the signal bearing media comprises transmission media see 1, lines 6-11, Fig. 1).

As to claim 10,

Chadha teaches wherein the signal bearing media comprises recordable media see 1, lines 6-11, Figs. 1, 13).

(10) Response to Argument

Appellant's arguments regarding the rejection of claims 1 – 10:

Argument A: Applicant has found nothing in Chadha '495 that in any way relates to the claimed steps of computing "a measure of entropy of attribute values" and/or "revalidating a prior statistic." There is simply nothing in Chadha '495 that describes the revalidation of statistics, i.e., determining whether those statistics are applicable to a new and different query than the query for which they were formed. Furthermore, nothing in Chadha '495 discusses the use of correlation values between attributes or other "entropy" figures to validate statistics.

Argument B: There is nothing in Jones to suggest the claimed invention of "revalidating a prior statistic generated for a prior different selection criterion", by the use of a "measure of entropy of [the] one or more attributes" of a relation.

Argument C: Chadha '146 in no way relates to "revalidating a prior statistic generated for a prior different selection criterion", by the use of a "measure of entropy of [the] one or more attributes" of a relation.

Argument D: The Examiner's rejection is an improper combination of references having nothing to do with the problem addressed by the present invention nor the solution presented by the claims. None of the references relates to "revalidating" statistics generated for one query, for use with another query, nor do they relate to the use of "entropy" values in making a "revalidation".

Examiner's Response to Arguments:

In response to above argument:

The Examiner respectfully submits that Chadha'495 teaches this limitation as, a key for a derived or base table is a minimal set of columns that can uniquely determine a tuple in the table. That is, given two tuples with the same values on the key columns, the data values of the other non-key columns of these two tuples must be the same, see col. 4, lines 49-53, Chadha'495. The SQL statements received as input from the user specify only the data that the user wants, but not how to get to it. This step considers both the available access paths (indexes, sequential reads, etc.) and system held statistics on the data to be accessed (the size of the table, the number of distinct values in a particular column, etc.), to choose what it considers to be the most efficient access path for the query, see col. 7, lines 11-18, Chadha'495.

Chadha'495 does not explicitly indicate the claimed revalidating. Jones remedy such kinds of deficiency by teaching request is revalidated, and a query plan will be formulate. If receiver client access is authorized, the MOL received at the receiver client is transformed into a second MOL, and transferred to the receiver client, see col. 15, lines 10-15, Fig. 40, Jones). It would have been obvious to one ordinary skill in the data processing art at the time of the present invention to combine the teachings of the cited references, because the revalidating of Jones teaching would have allowed Chadha's system to optimize the query plan as suggested by Jones at col. 7, lines 52-57.

Revalidating as taught by Jones improves to access the object in an object server in response to the database query, see col. 2, lines 33-35, Jones. Chadha'495

and Jones do not explicitly indicate the claimed entropy. Chadha '146 discloses the claimed entropy (rules used for data mining will appreciate that the association measures can be Chi-square, entropy, see col. 5, lines 14-15). It would have been obvious to one ordinary skill in the data processing art at the time of the present invention to combine the teachings of the cited references, because the revalidating of Jones teachings and entropy of Chadha ('46) teachings would have allowed Chadha's system to optimize the query plan as suggested by Jones at col. 7, lines 52-57 and dimension reduction for data mining without the need for a domain expert as suggested by Chadha ('46) at col. 2, lines 67 to col. 3, lines 1).

Examiner is entitled to give claim limitations their broadest reasonable interpretation in light of the specification. See MPEP 2111 [R-1]

Interpretation of Claims-Broadest Reasonable Interpretation

During patent examination, the pending claims must be 'given the broadest reasonable interpretation consistent with the specification.' Applicant always has the opportunity to amend the claims during prosecution and broad interpretation by the examiner reduces the possibility that the claim, once issued, will be interpreted more broadly than is justified. In re Prater, 162 USPQ 541,550-51 (CCPA 1969).

In response to applicant's argument that an improper combination of references having nothing to do with the problem addressed by the present invention, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves

or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

It would have been obvious to one ordinary skill in the data processing art at the time of the present invention to combine the teachings of the cited references, because the revalidating of Jones teaching would have allowed Chadha's system to optimize the query plan as suggested by Jones. Revalidating as taught by Jones improves to access the object in an object server in response to the database query. It would have been further obvious to one ordinary skill in the data processing art at the time of the present invention to combine the teachings of the cited references, because the revalidating of Jones teachings and entropy of Chadha ('146) teachings would have allowed Chadha's system to optimize the query plan as suggested by Jones and dimension reduction for data mining without the need for a domain expert as suggested by Chadha ('146).

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

This examiner's answer contains a new ground of rejection set forth in section (9) above. Accordingly, appellant must within **TWO MONTHS** from the date of this answer exercise one of the following two options to avoid *sue sponge dismissal of the appeal* as to the claims subject to the new ground of rejection:

(1) **Reopen prosecution.** Request that prosecution be reopened before the primary examiner by filing a reply under 37 CFR 1.111 with or without amendment, affidavit or other evidence. Any amendment, affidavit or other evidence must be relevant to the new grounds of rejection. A request that complies with 37 CFR 41.39(b)(1) will be entered and considered. Any request that prosecution be reopened will be treated as a request to withdraw the appeal.

(2) **Maintain appeal.** Request that the appeal be maintained by filing a reply brief as set forth in 37 CFR 41.41. Such a reply brief must address each new ground of rejection as set forth in 37 CFR 41.37(c)(1)(vii) and should be in compliance with the other requirements of 37 CFR 41.37(c). If a reply brief filed pursuant to 37 CFR 41.39(b)(2) is accompanied by any amendment, affidavit or other evidence, it shall be treated as a request that prosecution be reopened before the primary examiner under 37 CFR 41.39(b)(1).

Extensions of time under 37 CFR 1.136(a) are not applicable to the TWO MONTH time period set forth above. See 37 CFR 1.136(b) for extensions of time to reply for patent applications and 37 CFR 1.550(c) for extensions of time to reply for ex parte reexamination proceedings.

Respectfully submitted,

/Shahid Al Alam/

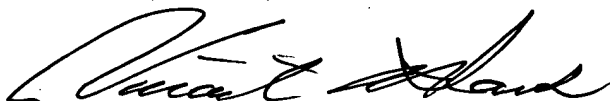
Primary Examiner, Art Unit 2162

**A Technology Center Director or designee must personally approve the
new ground(s) of rejection set forth in section (9) above by signing below:**

Conferees:


/John Breene/

Supervisory Patent Examiner, Art Unit 2162



Vincent Trans, *SPRE*

Technology center 2100



Jack B. Harvey, Director
Technology Center 2100